

Amendments to the Claims

Claim 1 (currently amended): A method for determining the function or effect of a genetic element or a chemical modulator from a library of said genetic elements and chemical modulators ~~of~~ having known and unknown function on a population of cells comprising:

- i) determining the distribution of an indicator nucleic acid sequence being expressed in said cells in the presence and the absence of a first chemical modulator or first genetic element, which modulator or genetic element affects said distribution of said indicator, wherein the cells are both co-expressing an effector nucleic acid sequence and are in the presence of a second chemical modulator or second genetic element; and
- ii) analysing the distribution data from all combinations of said effector, modulator or genetic element and indicator to derive functional linkages and assign function to the effector and said second modulator or second genetic element.

Claim 2 (currently amended): A method for determining the function or effect of a genetic element or a chemical modulator from a library of said genetic elements and chemical modulators of known and unknown function on a population of cells comprising:

- i) determining the distribution of an indicator nucleic acid sequence being expressed in said cells in the presence of a first chemical modulator or first genetic element, which modulator or genetic element affects said distribution of said indicator, wherein the cells are both co-expressing an effector nucleic

acid sequence and are in the presence of a second chemical modulator or
second genetic element;

- ii) comparing the distribution data of i) above with known distribution data, stored on an electronic or optical database, for the indicator nucleic acid sequence in the absence of said first chemical modulator or first genetic element; and
- iii) analysing the distribution data from all combinations of said effector, modulator or genetic element and indicator to derive functional linkages and assign function to the effector and said second modulator or second genetic element.

Claim 3 (currently amended): ~~The method according to either of claims 1 or 2,~~ The method of claim 1, wherein the effector nucleic acid sequence encodes a protein or peptide and is selected from the group consisting of DNA, cDNA, RNA and Protein Nucleic Acid.

Claim 4 (currently amended): ~~The method according to any of claims 1 to 3,~~ The method of claim 1, wherein the effector nucleic acid is an antisense oligonucleotide.

Claim 5 (currently amended): ~~The method according to any of claims 1 to 3,~~ The method of claim 1, wherein the effector nucleic acid is a small interfering RNA (siRNA) which causes gene silencing.

Claim 6 (currently amended): ~~The method according to any of claims 1 or 5,~~ The method of claim 1, wherein the effector nucleic acid ~~comprises~~ includes a nucleic acid sequence in a cellular expression vector.

Claim 7 (original): The method of claim 6, wherein said expression vector is selected from the group consisting of plasmid, retrovirus and adenovirus.

Claim 8 (currently amended): ~~The method according to any of claims 1 to 7,~~ The method of claim 1, wherein the indicator nucleic acid sequence comprises a detectable label or encodes a detectable label.

Claim 9 (currently amended): The method ~~according to~~ of claim 8, wherein the indicator nucleic acid sequence is created by fusing the effector sequence to a nucleic acid sequence encoding a detectable label.

Claim 10 (currently amended): ~~The method according to either of claims 8 or 9,~~ The method of claim 8, wherein said detectable label is selected from the group consisting of fluorescent proteins, enzymes, antigens and antibodies ~~protein, enzyme, antigen and antibody~~.

Claim 11 (currently amended): The method ~~according to~~ of claim 10, wherein said fluorescent protein is a modified Green Fluorescent Protein (GFP) having one or more mutations selected from the group consisting of Y66H, Y66W, Y66F, S65T, S65A, V68L, Q69K, Q69M, S72A, T203I, E222G, V163A, I167T, S175G, F99S, M153T, V163A, F64L, Y145F, N149K, T203Y, T203Y, T203H, S202F and L236R.

Claim 12 (currently amended): The method ~~according to~~ of claim 11, wherein said modified GFP has three mutations selected from the group consisting of F64L-V163A-E222G, F64L-S175G-E222G, F64L-S65T-S175G and F64L-S65T-V163.

Claim 13 (currently amended): The method ~~according to~~ of claim 10, wherein said enzyme is selected from the group consisting of β -galactosidase, nitroreductase, alkaline phosphatase and β -lactamase.

Claim 14 (currently amended): ~~The method according to any of claims 1 to 13, The~~ method of claim 1, wherein the modulator is selected from the group consisting of organic compound, inorganic compound, peptide, polypeptide, protein, carbohydrate, lipid, nucleic acid, polynucleotide and protein nucleic acid.

Claim 15 (currently amended): ~~The method according to any of claims 1 to 14, The~~ method of claim 1, wherein the modulator is selected from a combinatorial library comprising similar organic compounds such as analogues or derivatives.

Claim 16 (currently amended): ~~The method according to any of claims 1 to 15, The~~ method of claim 1, wherein said cell is an eukaryotic cell.

Claim 17 (currently amended): The method ~~according to~~ of claim 16, wherein said eukaryotic cell is selected from the group consisting of mammal, plant, bird, fungus, fish and nematode cells, which cell may or may not be genetically modified.

Claim 18 (currently amended): The method ~~according to~~ of claim 17, wherein said mammalian cell is a human cell, ~~which cell may or may not be genetically modified.~~

Claim 19 (currently amended): ~~The method according to any of claims 1 to 18,~~ The method of claim 1, wherein the distribution of the indicator nucleic acid is determined using an imaging system.

Claim 20 (cancelled)